

**WHAT IS CLAIMED IS:**

1. A thermal processing apparatus for heating a substrate by irradiating flashlight to said substrate, comprising:

5 a plurality of bar-like flash lamps, each having an elongated cylindrical shape;  
a lamp house for storing said plurality of flash lamps in such a state that a longitudinal direction of each of said plurality of flash lamps extends in a substantially horizontal direction, and that said plurality of flash lamps are arranged in parallel in a substantially horizontal direction that is substantially perpendicular to said longitudinal  
10 direction;

a chamber for storing a substrate and being disposed below said lamp house;

and

a transport robot for loading and unloading a substrate by advancing and retracting a transport arm with respect to said chamber, wherein:

15 said lamp house is disposed such that a direction of substrate loading and unloading by said transport robot is substantially perpendicular to said longitudinal direction.

2. The thermal processing apparatus according to claim 1 wherein  
20 said plurality of flash lamps are xenon flash lamps.

3. The thermal processing apparatus according to claim 2 wherein  
said chamber and an indexer are disposed on both sides of said transport robot  
along said direction of substrate loading and unloading.

4. The thermal processing apparatus according to claim 3 wherein  
said chamber has a cylindrical shape and has a disk-like heating plate on which  
a substrate is mounted and preheated prior to irradiation of flashlight, and  
the length of each of said plurality of flash lamps is greater than the outside  
5 diameter of said chamber.

5. A thermal processing apparatus for heating a substrate by irradiating  
flashlight to said substrate, comprising:

a plurality of lamp houses, each lamp house storing a plurality of bar-like flash  
10 lamps in such a state that a longitudinal direction of each of said plurality of flash lamps  
extends in a substantially horizontal direction, and that said plurality of flash lamps are  
arranged in parallel in a substantially horizontal direction that is substantially  
perpendicular to said longitudinal direction;

a plurality of chambers for storing a substrate, each chamber being disposed  
15 below each of said plurality of lamp houses; and

a transport robot for loading and unloading a substrate by advancing and  
retracting a transport arm with respect to each of said plurality of chambers, wherein:

all of said plurality of lamp houses are disposed such that a direction of  
substrate loading and unloading by said transport robot is substantially perpendicular to  
20 said longitudinal direction of said plurality of flash lamps.

6. The thermal processing apparatus according to claim 5 wherein  
said plurality of lamp houses are three lamp houses, and  
said three lamp houses are disposed 90° apart around said transport robot.

7. The thermal processing apparatus according to claim 6 wherein said plurality of flash lamps are xenon flash lamps.

8. A thermal processing apparatus for heating a substrate by irradiating  
5 flashlight to said substrate, comprising:

a plurality of bar-like flash lamps, each having an elongated cylindrical shape;

a lamp house of a rectangular shape, said lamp house storing said plurality of flash lamps in such a state that a longitudinal direction of each of said plurality of flash lamps extends in a longitudinal direction of said rectangular shape, and that said plurality  
10 of flash lamps are arranged in parallel in a substantially horizontal direction that is substantially perpendicular to said longitudinal direction of said rectangular shape;

a chamber for storing a substrate and being disposed below said lamp house;

and

a transport robot for loading and unloading a substrate by advancing and  
15 retracting a transport arm with respect to said chamber, wherein:

said lamp house is disposed such that a direction of substrate loading and unloading by said transport robot is substantially perpendicular to said longitudinal direction of said lamp house.

20 9. The thermal processing apparatus according to claim 8 wherein said plurality of flash lamps are xenon flash lamps.

10. The thermal processing apparatus according to claim 9 wherein  
said chamber and an indexer are disposed on both sides of said transport robot  
25 along said direction of substrate loading and unloading.

11. The thermal processing apparatus according to claim 10 wherein  
said chamber has a cylindrical shape and has a disk-like heating plate on which  
a substrate is mounted and preheated prior to irradiation of flashlight, and

5 the length of said longitudinal direction of said lamp house is greater than the  
outside diameter of said chamber.

12. A thermal processing apparatus for heating a substrate by irradiating  
flashlight to said substrate, comprising:

10 a plurality of lamp houses of a rectangular shape, each lamp house storing a  
plurality of bar-like flash lamps in such a state that a longitudinal direction of each of said  
plurality of flash lamps extends in a longitudinal direction of said rectangular shape, and  
that said plurality of flash lamps are arranged in parallel in a substantially horizontal  
direction that is substantially perpendicular to said longitudinal direction of said  
15 rectangular shape;

a plurality of chambers for storing a substrate, each chamber being disposed  
below each of said plurality of lamp houses; and

a transport robot for loading and unloading a substrate by advancing and  
retracting a transport arm with respect to each of said plurality of chambers, wherein:

20 all of said plurality of lamp houses are disposed such that a direction of  
substrate loading and unloading by said transport robot is substantially perpendicular to  
said longitudinal direction of said plurality of lamp houses.

13. The thermal processing apparatus according to claim 12 wherein

25 said plurality lamp houses are three lamp houses, and

said three lamp houses are disposed 90° apart around said transport robot.

14. The thermal processing apparatus according to claim 13 wherein said plurality of flash lamps are xenon flash lamps.